

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD  
SAN FRANCISCO BAY REGION

ORDER NO. 86-41

AN ORDER AMENDING ORDER NO. 76-9  
TO ADOPT CLOSURE REQUIREMENTS FOR:

CITY OF BERKELEY AND BERKELEY LANDFILL COMPANY  
SOLID WASTE DISPOSAL SITE  
BERKELEY, ALAMEDA COUNTY

The California Regional Water Quality Control Board, San Francisco Bay Region (hereinafter called the Board), finds that:

1. The Regional Board, on January 20, 1976, adopted Order No. 76-9 prescribing waste discharge requirements for the City of Berkeley and Berkeley Landfill Company, Alameda County.
2. The Regional Board on November 15, 1977 adopted Order No. 77-138 an Order amending Order No. 76-9 and prescribing a revised compliance time schedule for the City of Berkeley and Berkeley Landfill Company, Alameda County.
3. This Board's Order No. 76-9 required in Provision D.8 that the City of Berkeley and Berkeley Landfill Company (hereinafter collectively called the discharger) submit a closure plan at least 90 days prior to discontinuing use of the landfill site for waste disposal. The waste disposal operation ceased in July, 1983, and the discharger has submitted a general closure plan dated August 20, 1985 (Cooper Engineers). The closure plan elements contained in the report were derived primarily from the results of the following reports:
  - a) Report, Investigation of Berkeley Landfill Perimeter Dikes; April 1, 1976, Harding-Lawson, Associates.
  - b) Geotechnical Services, Phase I-North Waterfront Park, Berkeley Marina; May 19, 1980, Geo/Resource Consultants, Inc.
  - c) Geotechnical Services, Closure Plan, North Waterfront Park-Phase I; March 10, 1981, Geo/Resource Consultants, Inc.

- d) Water Balance Analysis, North Waterfront Park (Memorandum Report); November 21, 1980, EMCON Associates.
- e) Geotechnical Investigation and Slope Stability Analyses, Berkeley North Waterfront Park Landfill; December 14, 1981, Geo/Resource Consultants, Inc.
- f) Review of Revised Grading Plan, North Waterfront Park, Berkeley Marina (Memorandum Report); March 23, 1982, Geo/Resource Consultants, Inc.
- g) Landfill Gas Monitoring and Evaluation Program, Proposed Maintenance Building, North Waterfront Park, Phase II; February 16, 1982, Cooper Engineers.
- h) Gas Migration Control System, Marina Maintenance Building at the Berkeley Landfill; June 1982, Cooper Engineers.
- i) Preliminary Report, Slope Stability Analysis Update, Berkeley Landfill; August 10, 1984, Geo/Resource Consultants.
- j) Report, Geotechnical Services, Proposed North Waterfront Park-Phase II; August 8, 1985, Cooper Engineers.

Subsequent to submittal of the general closure plan the following technical documentation has been submitted:

- k) Slope Stability Analysis, Berkeley Landfill Closure; April 7, 1986, Cooper Engineers.
- l) Closure and Post-Closure Maintenance Plan for Phases II through IV, North Waterfront Park, Berkeley; April 11, 1986, Harding Lawson Associates.
- m) Supplemental Geotechnical Report, North Waterfront Park, Phase II, Berkeley; April 11, 1986, Cooper Engineers.
- n) Water Balance Analysis, North Waterfront Park, Phase II, Berkeley; April 24, 1986, Cooper Engineers.

- o) Infiltration Detection System, North Waterfront Park, Phase II, Berkeley; May 5, 1986, Harding Lawson Associates.
  - p) Addendum to Closure and Post-Closure Maintenance Plan for Phases II through IV, North Waterfront Park, Berkeley; May 9, 1986, Harding Lawson Associates.
  - g) Report - Geotechnical Services, North Waterfront Park, Phases III and IV, Berkeley; May 9, 1986, Cooper Engineers.
4. The discharger proposes to convert the 90-acre inactive landfill site into a park, and to divide the area into three zones according to the type and intensity of proposed recreational use in each: 1) a recreation zone, 2) a transition zone, and 3) a natural zone. The most intense recreational use is planned to be in the recreational zone which is divided into the areas of Phases I, II, III and IV. A transition zone is planned to be placed between the recreation zone and the natural zone as a buffer. The natural zone is planned to be at the north end of the site, surrounded by water on three sides and by the transition zone of the south side. Although a pond is shown in the Conceptual Park Plan (Attachment A) in the natural zone, construction of such pond is currently not proposed, and the pond is not authorized as part of these closure requirements.
5. The discharger proposes to develop the entire 90-acre site as the North Waterfront Park. The conversion of this site into the park will be done in phases. Phase I has been completed, and closed pursuant to regulations in effect in August, 1981. Phase II has been constructed to rough final grade and is currently being groomed for final contouring and placement of vegetation and other fixtures. Phases III and IV, scheduled to be completed by August 1, 1987, are proposed to be generally flat areas for ball fields and picnic areas. The remaining area will eventually be converted into recreational areas, a wildlife area, transition zones and pedestrian pathways. A foundation layer is currently being provided in these areas. The final closure of the site is anticipated to be completed by November 1, 1989.
6. The submitted general closure plan and technical reports cited in Finding 3 documents that Phase II has already been

physically closed in a manner consistent with the new Subchapter 15 regulations (Subchapter 15 of Chapter 3 of Title 23, California Administrative Code, is herein referred to as Subchapter 15). The thickness of the cover material over the Phase II area varies from 7.5 feet to greater than 30 feet. The cover material generally consists of sandy and silty clay with some zones of clayey sand and a few scattered zones of silty sand. It has been documented that a continuous layer of at least one foot of clay material meeting the minimum permeability requirements of  $1.0 \times 10^{-6}$  cm/sec is in place. The Phase II area is approximately 10 acres and is planned to consist of landscaped area containing ground cover, irrigation facilities, pathways and picnic facilities. Vegetation will consist mainly of mowed turf grass and other low ground cover with scattered small shrubs.

7. The submitted general closure plan and technical reports cited in Finding 3 documents that Phases III and IV has been partially closed in a manner consistent with the new Subchapter 15 regulations. The cover thickness over the Phases III and IV area varies from about 7 to 20 feet over most of the area with an estimated thickness of up to 40 feet in the mound area. The cover material generally consists of stiff sandy clay that occasionally grades to a very clayey sand. However, a continuous minimum one foot clay layer does not appear to exist over the northern portion. Therefore, a clay layer will be constructed over the northern portion of Phases III and IV pursuant to submitted documentation. The final cover over Phases III and IV will consist of an area with a constructed clay and vegetative layer in the northern portion, an area of existing cover in the southern portion and a transition zone where the new and existing clay layers will be tied together. Phases III and IV are proposed to be generally flat areas for ball fields and picnic areas.
8. The discharger's general and amended closure plan is deficient with regard to one new closure requirements of Subchapter 15. The discharger has not established an irrevocable closure fund, or other equivalent guarantees, to assure that funds for closure, post-closure monitoring, and any future remedial actions which the Board may require, will be available.

9. The Regional Board adopted a revised Water Quality Plan for the San Francisco Bay Basin on July 1, 1982 and this Order implements the water quality objectives stated in that plan.
10. This Order authorizes the closure of a Class III (formerly a Class II-2 landfill utilizing the old designation) landfill. The order governs maintenance of an existing facility and does not have a significant effect on the environment pursuant to Section 21084 (a) of the California Environmental Quality Control Act and Section 15310 of the Resources Code.
11. The Board has notified the discharger and interested agencies and persons of its intent to prescribe closure requirements for the discharger, and has provided them with an opportunity to submit their written views and recommendations.
12. The Board heard and considered in a public meeting all comments pertaining to the discharge.

IT IS ORDERED that Order No. 76-9 is hereby amended as follows:

1. The following Provisions are added, as Provisions D.12 through D.20:
  12. Phases II, III, and IV of the recreation zone of the North Waterfront Park shall be closed in accordance with the general closure plan dated August 20, 1985, and pursuant to subsequently submitted plans and technical reports cited in Finding 3.
  13. As portions of the North Waterfront Park are completed, the exterior surfaces shall be graded to a minimum slope of three percent in order to promote lateral runoff of precipitation. In addition, all completed areas shall be covered with a minimum of 4 feet of cover as described in Subchapter 15 and meet all other applicable requirements as described in Article 8 of Subchapter 15.
  14. The leachate monitoring and control system shall be maintained and operated to prevent the buildup of hydraulic head on the bottom of the landfill. This system shall be inspected monthly, and any accumulated fluid shall be removed.


15. The discharger shall ensure that the foundation of the site, the refuse fill, and the structures which control leachate, surface drainage, erosion and gas for this site are constructed and maintained to withstand conditions generated during the maximum probable earthquake.
16. The discharger shall continue to comply with all applicable provisions of the Self-Monitoring Program issued to this facility on July 12, 1979 until such time as the Self-Monitoring Program is revised, or deemed no longer necessary by the Executive Officer on the basis of a demonstration that the landfill can no longer have a negative impact on beneficial uses of the waters of the state.
17. The discharger shall, within 120 days of the effective date of this order, provide evidence of the existence of an irrevocable closure fund which contains or will contain sufficient funds to ensure post-closure monitoring and maintenance of the solid waste disposal site throughout the post-closure period. The discharger may wish to provide other financial means to ensure post-closure monitoring and maintainance, but a proposal describing this 'other mean' must be submitted in detail within 60 days of the effective date of this order, and must be acceptable to the Executive Officer. Approval of 'other means' by the Executive Officer will be based on a demonstration that they provide equivalent funding to that provided by an irrevocable fund.
18. The discharger shall complete closure of the entire site pursuant to the following time schedule:

<u>Task</u>	<u>Compliance Date</u>	<u>Report of Compliance due</u>
Complete closure of Phase II of the Recreational zone. (Report of compliance shall include final contour drawings and locations and specifications of hydrovisors and lysimeters)	Nov. 1, 1986	Nov. 15, 1986

<u>Task</u>	<u>Compliance Date</u>	<u>Report of Compliance due</u>
Complete closure of Phase III and IV of the Recreational zone (Report of compliance shall include final contour drawings, certification of continuous clay layer, and locations and specifications of hydrovisors and lysimeters)	Aug. 1, 1987	August 15, 1987
Submit Progress Reports	Jan. 1, 1988 July 1, 1988 Jan. 1, 1989 July 1, 1989	
Complete closure of entire site (Report of compliance shall include documentation of implementation of the closure and maintenance plan submitted pursuant to Prov. D.19)	Nov 1, 1989	Nov. 15, 1989

19. The discharger shall submit a Closure and Maintenance plan for the transistion and natural zones of the proposed North waterfront Park at least 90 days prior to the proposed start of construction of the upper two feet of cover of these zones. The plan shall be consistent with the general closure plan and address all applicable sections of Articles 8 and 9 of Subchapter 15. The plan shall provide documentation that appropriate materials have been listed as a foundation layer and that the layer has been compacted to the maximum density obtainable at optimum moisture content using methods that are in accordance with accepted civil engineering practice. The plan shall further address the tie-in between the recreational zone and other zones to assure a continuous low permeability clay layer of not less than one foot over the entire 90 acre site. Construction of the upper two feet of cover shall not start until this plan has been found satisfactory by the Executive Officer.

I, Roger B. James, Executive Officer, do hereby certify that the foregoing is a full, complete, and correct copy of an Order adopted by the California Regional Water Quality Control Board, San Francisco Bay Region, on



ROGER B. JAMES  
Executive Officer

Attachment A: Conceptual Layout  
of Closure Plan

## CONCEPTUAL LAYOUT

